

AMENDMENT TO THE CLAIMS

1. (Currently Amended) A control device for controlling at least one bottom dump air operated door for a railroad car movable between a closed position in which material within the railroad car is retained within the railroad car and an open position in which the material within the railroad car is released therefrom
5 comprising:

a housing supported by the railroad car;

a piston movable in said housing between a door closing position

and a door opening position in response to air pressure

10 acting in a first direction on said piston to cause movement

of the door to its open position and to air pressure acting

in a second direction on said piston to cause movement of

the door to its closed position;

and a control element for preventing air pressure from acting in

15 the first direction on said piston until the air pressure

exceeds a predetermined ~~amount~~ air pressure.

2. (Currently Amended) The control device according to claim 1 in which said control element comprises a pressure responsive element between a source of air pressure and said piston to block supply of air pressure in the first direction for preventing the
5 air pressure from acting in the first direction on said piston until the air pressure exceeds a predetermined ~~amount~~ air pressure.

3. (Currently Amended) The control device according to claim 2 comprising:

a first air passage in said housing communicating with a source of air pressure to cause air pressure to act on said piston in the first direction to move said piston to its door opening position when said piston is in its door closing position;

and said pressure responsive element comprising:

a first portion movably disposed in said first air passage;

and a second portion holding said first portion in a passage blocking position until the air pressure exceeds a predetermined ~~amount~~ air pressure.

4. (Currently Amended) The control device according to claim 3 in which said second portion of said pressure responsive element is a resilient element disposed in said first air passage and continuously urging said first portion of said pressure responsive element into its passage blocking position when the air pressure does not exceed the predetermined ~~amount~~ air pressure.

5. (Original) The control device according to claim 4 in which:

said first air passage has a reduced area portion;

and said first portion of said pressure responsive element is a ball urged into engagement with said reduced area portion of said first air passage by said resilient element to hold said ball in its passage blocking position.

6. (Original) The control device according to claim 5 comprising:

a second air passage in said housing communicating with the source of air pressure to cause the air pressure to act on said piston in the second direction to move said piston to its door closing position when said piston is in its door opening position;

a first activating element for allowing the air pressure to be applied to said piston to cause movement of the door to its open position when said ball is not in its passage blocking position and the railroad car is at a first predetermined position at which it is desired for the door to open to release the material in the railroad car;

and a second activating element for allowing the air pressure to be applied to said piston to cause movement of the door to its closed position when the railroad car is at a second predetermined position at which it is desired for the door to close, the second predetermined position being spaced a predetermined distance in the direction of movement of the railroad car from the first predetermined position.

7. (Original) The control device according to claim 6 in which:

said first activating element comprises a first solenoid activated in response to the railroad car being at the first predetermined position to cause the air pressure to be

applied to said piston in the first direction to cause movement of the door to its open position;
and said second activating element comprises a second solenoid activated in response to the railroad car being at the
10 second predetermined position to cause the air pressure to be applied to said piston in the second direction to cause movement of the door to its closed position.

8. (Currently Amended) A control device for controlling at least one bottom dump air operated door for a railroad car movable between a closed position in which material within the railroad car is retained within the railroad car and an open
5 position in which the material within the railroad car is released therefrom comprising:

a housing supported by the railroad car and having a sealed interior;

said housing having first and second chambers aligned with each other in its sealed interior and spaced longitudinally from
10 each other;

a piston slidably disposed within the sealed interior of said housing;

said piston having:

15 one end disposed in said first chamber in sealing relation therewith;

and its other end disposed in said second chamber in sealing relation therewith;

a first end cap mounted at one end of said housing;

20 said first end cap having a first air passage communicating with
the sealed interior of said housing exterior of said first
and second chambers and a second air passage communicating
with said first chamber;
a first solenoid supported by said first end cap, said first
25 solenoid allowing air pressure to flow through said air
passage in said first end cap to said second air passage in
said first end cap when said first solenoid is activated;
a second end cap mounted at the other end of said housing;
said second end cap having a first air passage communicating with
30 the sealed interior of said housing exterior of said first
and second chambers and a second air passage communicating
with said second chamber;
a second solenoid supported by said second end cap, said second
solenoid allowing air pressure to flow through said first
35 air passage in said second end cap to said second air
passage in said second end cap when said second solenoid is
activated;
a sliding shoe valve disposed within the sealed interior of said
housing exterior of said first and second chambers and
40 connected to said piston for movement therewith;
said housing having a port communicating a source of air pressure
with the sealed interior of said housing exterior of said
first and second chambers;
said housing having two ports communicating with a control member
45 for moving the door to its open or closed position depending

on the position of said sliding shoe valve relative to said two ports, one of said two ports supplying air pressure to the control member from the sealed interior of said housing exterior of said first and second chambers when the door in the railroad car is to be opened and the other of said two ports supplying air pressure from the sealed interior of said housing exterior of said first and second chambers to the control member when the door in the railroad car is to be closed;

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55 said first air passage in said first end cap supplying air pressure from the sealed interior of said housing exterior of said first and second chambers through said second air passage in said first end cap to said first chamber to move said piston to its door opening position when said first solenoid is activated;

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said first air passage in said second end cap supplying air pressure from the sealed interior of said housing exterior of said first and second chambers through said second air passage in said second end cap to said second chamber to move said piston to its door closing position when said second solenoid is activated;

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and a control element disposed in said first air passage in said first end cap for preventing air pressure to pass therethrough until it exceeds a predetermined ~~amount~~ air pressure.

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9. (Currently Amended) The control device according to claim 8
in which said control element comprises a pressure responsive
element in said first air passage in said first end cap between
the sealed interior of said housing exterior of said first and
5 second chambers and said second air passage in said first end cap
to block supply of air pressure through said second air passage
to said first chamber for acting on said piston to move said
piston to its door opening position when said piston is in its
door closing position and said first solenoid is activated until
10 the air pressure exceeds a predetermined ~~amount~~ air pressure.

10. (Currently Amended) The control device according to claim 9
in which said pressure responsive element comprises:

a first portion movably disposed in said first air passage in
said first end cap;

5 and a second portion holding said first portion in a passage
blocking position until the air pressure exceeds a
predetermined ~~amount~~ air pressure.

11. (Currently Amended) The control device according to claim
10 in which said second portion of said pressure responsive
element is a resilient element disposed in said first air passage
in said first end cap and continuously urging said first portion
5 of said pressure responsive element into its passage blocking
position when the air pressure does not exceed the predetermined
~~amount~~ air pressure.

12. (Original) The control device according to claim 11 in which:

said first air passage in said first end cap has a reduced area portion;

5 and said first portion of said pressure responsive element is a ball urged into engagement with said reduced area portion of said first air passage in said first end cap by said resilient element to hold said ball in its passage blocking position.

13. (Currently Amended) A control device for controlling at least one bottom dump air operated door for a railroad car movable between a closed position in which material within the railroad car is retained within the railroad car and an open
5 position in which the material within the railroad car is released therefrom comprising:

a housing supported by the railroad car and having a sealed interior;

said housing having first and second chambers aligned with each
10 other in its sealed interior and spaced longitudinally from each other;

a piston slidably disposed within the sealed interior of said housing;

said piston having:

15 one end disposed in said first chamber in sealing relation ~~therewith:~~ therewith;

and its other end disposed in said second chamber in sealing
relation therewith;

a first end cap mounted at one end of said housing;

20 said first end cap having a first air passage communicating with
the sealed interior of said housing exterior of said first
and second chambers and a second air passage communicating
with said first chamber;

a first activating element supported by said first end cap, said
25 first activating element allowing air pressure to flow
through said first air passage in said first end cap to said
second air passage in said first end cap when said first
activating element is activated;

a second end cap mounted at the other end of said housing;

30 said second end cap having a first air passage communicating with
the sealed interior of said housing exterior of said first
and second chambers and a second air passage communicating
with said second chamber;

a second activating element supported by said second end cap,
35 said second activating element allowing air pressure to flow
through said first air passage in said second end cap to
said second air passage in said second end cap when said
second activating element is activated;

a sliding shoe valve disposed within the sealed interior of said
40 housing exterior of said first and second chambers and
connected to said piston for movement therewith;

said housing having a port communicating a source of air pressure with the sealed interior of said housing exterior of said first and second chambers;

45 said housing having two ports communicating with a control member for moving the door to its open or closed position depending on the position of said sliding shoe valve relative to said two ports, one of said two ports supplying air pressure to the control member from the sealed interior of said housing
50 exterior of said first and second chambers when the door in the railroad car is to be opened and the other of said two ports supplying air pressure from the sealed interior of said housing exterior of said first and second chambers to the control member when the door in the railroad car is to
55 be closed;

said first air passage in said first end cap supplying air pressure from the sealed interior of said housing exterior of said first and second chambers through said second air passage in said first end cap to said first chamber to move
60 said piston to its door opening position when said first activating element is activated;

said first air passage in said second end cap supplying air pressure from the sealed interior of said housing exterior of said first and second chambers through said second air
65 passage in said second end cap to said second chamber to move said piston to its door closing position when said second activating element is activated;

and a control element disposed in said first air passage in said first end cap for preventing air pressure to pass therethrough until it exceeds a predetermined ~~amount~~ air pressure.

14. (Currently Amended) The control device according to claim 13 in which said control element comprises a pressure responsive element in said first air passage in said first end cap between the sealed interior of said housing exterior of said first and second chambers and said second air passage in said first end cap to block supply of air pressure through said second air passage to said first chamber for acting on said piston to move said piston to its door opening position when said piston is in its door closing position and said first activating element is activated until the air pressure exceeds a predetermined ~~amount~~ air pressure.

15. (Currently Amended) The control device according to claim 14 in which said pressure responsive element comprises:
a first portion movably disposed in said first air passage in said first end cap;

and a second portion holding said first portion in a passage blocking position until the air pressure exceeds a predetermined ~~amount~~ air pressure.

16. (Currently Amended) The control device according to claim 15 in which said second portion of said pressure responsive element is a resilient element disposed in said first air passage in said first end cap and continuously urging said first portion

5 of said pressure responsive element into its passage blocking position when the air pressure does not exceed the predetermined ~~amount~~ air pressure.

17. (Original) The control device according to claim 16 in which:

said first air passage in said first end cap has a reduced area portion;

5 and said first portion of said pressure responsive element is a ball urged into engagement with said reduced area portion of said first air passage in said first end cap by said resilient element to hold said ball in its passage blocking position.

18. (Currently Amended) A control device for controlling at least one bottom dump air operated door for a railroad car movable between a closed position in which material within the railroad car is retained within the railroad car and an open
5 position in which the material within the railroad car is released therefrom comprising:

a housing supported by the railroad car;

a piston movable in said housing between a door closing position and a door opening position in response to air pressure
10 acting in a first direction on said piston to cause movement of the door to its open position and to air pressure acting in a second direction on said piston to cause movement of the door to its closed position;

and a resiliently biased control element for preventing movement
15 of said piston to its door opening position until the air
pressure acting on said piston exceeds a predetermined
~~amount~~ air pressure.

19. (Currently Amended) The control device according to claim
18 in which said resiliently biased control element comprises a
pressure responsive element between a source of air pressure and
said piston to block supply of air pressure in the first
5 direction for preventing the air pressure from acting in the
first direction on said piston until the air pressure exceeds a
predetermined ~~amount~~ air pressure.

20. (Currently Amended) The control device according to claim
19 comprising:

a first air passage in said housing communicating with a source
of air pressure to cause air pressure to act on said piston
5 in the first direction to move said piston to its door
opening position when said piston is in its door closing
position;

and said pressure responsive element comprising:

a first portion movably disposed in said first air passage;

10 and a second portion holding said first portion in a passage
blocking position until the air pressure exceeds a
predetermined ~~amount~~ air pressure.

21. (Currently Amended) The control device according to claim 20 in which said second portion of said pressure responsive element is a resilient element disposed in said first air passage and continuously urging said first portion of said pressure responsive element into its passage blocking position when the air pressure does not exceed the predetermined ~~amount~~ air pressure.

22. (Currently Amended) A control device for controlling at least one bottom dump air operated door for a railroad car movable between a closed position in which material within the railroad car is retained within the railroad car and an open position in which the material within the railroad car is released therefrom only when the railroad car is at a predetermined position along its predetermined travel path at which it is desired for the door to open comprising:

a housing supported by the railroad car;

a piston movable in said housing between a door closing position and a door opening position in response to air pressure acting in a first direction on said piston to cause movement of the door to its open position and to air pressure acting in a second direction on said piston to cause movement of the door to its closed position;

and a control element for preventing the door from opening until the railroad car is at the predetermined position along its predetermined travel path and the air pressure in said housing exceeds a predetermined ~~amount~~ air pressure.

23. (Currently Amended) The control device according to claim 22 in which said control element prevents the door from opening until the railroad car is at the predetermined position along its predetermined travel path by preventing air pressure from acting in the first direction on said piston until the air pressure in said housing exceeds a predetermined ~~amount~~ air pressure at the predetermined position of the railroad car along its predetermined travel path.

24. (Previously Presented) A method for controlling at least one bottom dump air operated door for a railroad car movable between a closed position in which material within the railroad car is retained within the railroad car and an open position in which the material within the railroad car is desired to be released therefrom only when the railroad car is at a predetermined position along its predetermined travel path comprising:

moving a piston in a housing between a door closing position and

a door opening position in response to air pressure acting in a first direction on the housing piston to cause movement of the door to its open position and to air pressure acting in a second direction on the housing piston to cause movement of the door to its closed position;

and preventing movement of the housing piston to its door opening position at the predetermined position of the railroad car along its predetermined travel path until a predetermined air pressure in the housing is exceeded.

25. (Currently Amended) The method according to claim 24

comprising preventing the air pressure in the housing from
acting in the first direction on the housing piston to cause
movement of the door to its open position unless the
5 railroad car is at the predetermined position along its
predetermined travel path and it is determined that the air
pressure in the housing acting in the first direction on the
housing piston exceeds a predetermined ~~amount~~ air pressure.

26. (Previously Presented) The method according to claim 25
comprising:

supplying the air pressure in the housing to act on a piston
connected to the door and disposed in a cylinder supported
5 by the railroad car to move the door connected piston to
open the door when the housing piston is moved in the first
direction;

and supplying the air pressure in the housing to act on the door
connected piston and disposed in the cylinder supported by
10 the railroad car to move the door connected piston to close
the door when the housing piston is moved in the second
direction.

27. (Previously Presented) The method according to claim 24
comprising:

supplying the air pressure in the housing to act on a piston
connected to the door and disposed in a cylinder supported
5 by the railroad car to move the door connected piston to

open the door when the housing piston is moved in the first direction;

and supplying the air pressure in the housing to act on the door connected piston and disposed in the cylinder supported by the railroad car to move the door connected piston to close the door when the housing piston is moved in the second direction.

28. (Currently Amended) A railroad car having at least one bottom dump air operated door movable between a closed position in which material within the railroad car is retained within the railroad car and an open position in which the material within the railroad car is released therefrom only when the railroad car is at a predetermined position along its predetermined travel path at which it is desired for said door to open;

a cylinder supported by the railroad car;

a piston disposed in said cylinder and connected to said door for

moving said door between its closed and open positions;

a control device for controlling supply of air pressure to said door connected piston to move said door between its closed and open positions;

and said control device comprising:

a housing supported by the railroad car;

a piston movable in said housing between a door closing position and a door opening position in response to air pressure acting in a first direction on said housing piston to cause movement of the door to its open

20 position and to air pressure acting in a second
direction on said housing piston to cause movement of
the door to its closed position;
said housing piston allowing air pressure in said housing to
act on one side of said door connected piston to open
25 said door when the air pressure moves said housing
piston to its door opening position to enable the air
pressure in said housing to flow from said housing to
said cylinder to act on the one side of said door
connected piston;
30 said housing piston allowing air pressure in said housing to
act on the other side of said door connected piston to
close said door when the air pressure moves said
housing piston to its door closing position to enable
the air pressure in said housing to flow from said
35 housing to said cylinder to act on the other side of
said door connected piston;
and a control element for preventing movement of said
housing piston to enable air pressure to flow from said
housing to said cylinder to act on the one side of said
40 door connected piston to open said door until the air
pressure exceeds a predetermined ~~amount~~ air pressure at
the predetermined position of the railroad car along
its predetermined travel path.

29. (Currently Amended) The railroad car according to claim 28 in which said control element comprises a pressure responsive element between a source of air pressure and said housing piston to block supply of the air pressure in the first direction for preventing the air pressure from acting in the first direction on said housing piston until the air pressure exceeds a predetermined ~~amount~~ air pressure.

30. (Currently Amended) The railroad car according to claim 29 comprising:

a first air passage in said housing communicating with a source of air pressure to cause air pressure to act on said housing piston in the first direction to move said housing piston to its door opening position when said housing piston is in its door closing position;

and said pressure responsive element comprising:

a first portion movably disposed in said first air passage;

and a second portion holding said first portion in a passage blocking position until the air pressure exceeds a predetermined ~~amount~~ air pressure.

31. (Currently Amended) The railroad car according to claim 30 in which said second portion of said pressure responsive element is a resilient element disposed in said first air passage and continuously urging said first portion of said pressure responsive element into its passage blocking position when the air pressure does not exceed the predetermined ~~amount~~ air pressure.

32. (Previously Presented) A control device for controlling at least one bottom dump air operated door for a railroad car movable between a closed position in which material within the railroad car is retained within the railroad car and an open position in which the material within the railroad car is released therefrom only when the railroad car is at a predetermined position along its predetermined travel path at which it is desired for the door to open comprising:

a housing supported by the railroad car;

a piston movable in said housing between a door closing position and a door opening position in response to air pressure acting in a first direction on said piston to cause movement of the door to its open position and to air pressure acting in a second direction on said piston to cause movement of the door to its closed position;

and a control element for preventing movement of said piston to its door opening position at the predetermined position along its predetermined travel path until a predetermined air pressure in said housing is exceeded.

33. (Currently Amended) The control device according to claim 32 in which said control element comprises a pressure responsive element between a source of air pressure and said piston to block supply of the air pressure in the first direction for preventing the air pressure from acting in the first direction on said piston until the air pressure exceeds a predetermined ~~amount~~ air pressure.

34. (Currently Amended) The control device according to claim 33 comprising:

a first air passage in said housing communicating with a source of air pressure to cause air pressure to act on said piston in the first direction to move said piston to its door opening position when said piston is in its door closing position;

and said pressure responsive element comprising:

a first portion movably disposed in said first air passage;

and a second portion holding said first portion in a passage blocking position until the air pressure exceeds a predetermined ~~amount~~ air pressure.

35. (Currently Amended) The control device according to claim 34 in which said second portion of said pressure responsive element is a resilient element disposed in said first air passage and continuously urging said first portion of said pressure responsive element into its passage blocking position when the air pressure does not exceed the predetermined ~~amount~~ air pressure.